



A.D. 1857 N° 992.

S P E C I F I C A T I O N

OF

JASPER WHEELER ROGERS.

APPARATUS FOR THE COLLECTION OF
NIGHT SOIL AND DRAINAGE OF HOUSES.

L O N D O N :

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A.D. 1857 N° 992.

**Apparatus for the Collection of Night Soil and
Drainage of Houses.**

LETTERS PATENT to Jasper Wheeler Rogers, of Peat House, Roberts Town, in the County of Kildare, Engineer, for the Invention of “**IMPROVED MEANS OF AND APPARATUS FOR COLLECTING FOR USE THE EXCREMENT OF TOWNS AND VILLAGES, AND FOR FACILITATING THE DRAINAGE OF HOUSES GENERALLY.**”

Sealed the 6th October 1857, and dated the 8th April 1857.

PROVISIONAL SPECIFICATION left by the said Jasper Wheeler Rogers at the Office of the Commissioners of Patents, with his Petition, on the 8th April 1857.

I, JASPER WHEELER ROGERS, of Peat House, Roberts Town, in the County
5 of Kildare, Engineer, do hereby declare the nature of the said Invention for
“**IMPROVED MEANS OF AND APPARATUS FOR COLLECTING FOR USE THE EXCREMENT OF
TOWNS AND VILLAGES, AND FOR FACILITATING THE DRAINAGE OF HOUSES GENERALLY,**”
to be as follows:—

The chief object of this Invention is to collect and utilize the night soil
10 which is now discharged by the house drains of large towns and cities into the
main sewers and thence passed off into an adjacent river, whereby the stream
is polluted and the night soil is wasted.

In carrying out the above object, I propose to insert in the existing sewers
cast-iron pipes of any suitable capacity, and to connect them with the pipes

Rogers' Improved Means, &c. for Collecting for Use the Excrement of Towns, &c.

which lead from the several houses in the route of the sewer. These cast-iron pipes, which I call the house mains, I lead to a large chamber or receptacle built near the mouth of the sewer, in order that they may discharge their contents therein. This chamber I build air-tight, and when placed on a tidal river I provide it with a series of discharge pipes for running off at 5 different levels or states of the tide the liquid portions of the house drainage, conducted to it by the house mains after they have passed through a filter bed also contained in the chamber. I also fit up in it a lift pump and an air pump, and I likewise apply to it an Archimedean lift for raising the solid matters and discharging them into proper receptacles, as required. 10 The house sewage when it enters the chamber will fall to the bottom, and the fluid portions, being the lighter, will, as the pressure accumulates, pass upwards through a filter bed of peat charcoal, by which it will be deprived of all its ammoniacal and other noxious properties. The water will then pass off by the discharge pipes in a pure limped state, leaving a valuable deposit in 15 the chamber. When the solid matter has sufficiently accumulated it is lifted by the Archimedean screw, the pipe in which the screw works being pierced to ensure a thorough drainage. The water also may, when required, be discharged by means of a lifting or force pump. In order to keep the house mains clear and to prevent the possibility of a discharge of deleterious gases 20 into the houses from the mains, I propose from time to time to employ atmospheric pressure to assist in discharging the mains. To this end I form by the aid of the air pump a vacuum or partial vacuum in the large chamber or receptacle, having previously by means of valves shut off the connection between the mains and the chamber; I then, when the expansion is sufficient, 25 open the valves, and the discharge of the mains will immediately take place, the pressure of air behind any obstruction causing the instant displacement of the same and driving it forward into the chamber.

By this arrangement it will be understood that I interfere in no respect with the discharge of the surface drainage, but effectually prevent it from becoming 30 mixed with the night soil, and thereby render the utilizing of that substance as a manure a very simple and profitable operation. The filter bed when saturated with the ammoniacal matters derived from the discharged liquid will also form a valuable manure.

Rogers' Improved Means, &c. for Collecting for Use the Excrement of Towns, &c.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Jasper Wheeler Rogers in the Great Seal Patent Office on the 8th October 1857.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JASPER
5 WHEELER ROGERS, of Peat House, Roberts Town, in the County of Kildare, Engineer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Eighth day of April, in the year of our Lord One thousand eight hundred and fifty-seven, in the twentieth year of Her reign, did,
10 for Herself, Her heirs and successors, give and grant unto me, the said Jasper Wheeler Rogers, Her special license that I, the said Jasper Wheeler Rogers, my executors, administrators, and assigns, or such others as I, the said Jasper Wheeler Rogers, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter
15 during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for “**IMPROVED MEANS OF AND APPARATUS FOR COLLECTING FOR USE THE EXCREMENT OF TOWNS AND VILLAGES, AND FOR FACILITATING THE DRAINAGE OF HOUSES GENERALLY,**” upon the
20 condition (amongst others) that I, the said Jasper Wheeler Rogers, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of
25 the said Letters Patent.

NOW KNOW YE, that I, the said Jasper Wheeler Rogers, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the Drawings hereunto annexed,
30 and to the letters and figures marked thereon (that is to say):—

The chief object of this Invention is to collect and utilize the night soil which is now discharged by the house drains of large towns and cities into the main sewers and thence passed off into an adjacent river, whereby the stream is polluted and the night soil is wasted.

35 In carrying out the above object, I propose to insert in the existing sewers cast-iron or other air-tight pipes of any suitable capacity, and to connect them with the pipes which lead from the several houses in the route of the sewer. These air-tight pipes, which I call the “house refuse mains,” I lead to a large

Rogers' Improved Means, &c. for Collecting for Use the Excrement of Towns, &c.

chamber or receptacle built near the mouth of the sewer, in order that they may discharge their contents therein. This chamber I build air-tight, and when placed on a tidal river I provide it with a series of discharge pipes for running off at different levels or states of the tide the liquid portions of the house drainage, conducted to it by the house mains after they have passed 5 through a filter bed, also contained in the chamber. I also fit up in it a lift pump and an air pump, and I likewise apply to it an Archimedean lift for raising the solid matters and discharging them into proper receptacles, as required. The house sewage when it enters the chamber will fall to the bottom, and the fluid portions, being the lighter, will, as the pressure accumulates, pass 10 upwards through a filter bed of peat charcoal, by which it will be deprived of all its ammoniacal and other noxious properties; the water will then pass off by the discharge pipes in a pure limpid state, leaving a valuable deposit in the chamber. When the solid matter has sufficiently accumulated it is lifted by the Archimedean screw, the pipe in which the screw works being pierced to 15 ensure a thorough drainage. The water also may, when required, be discharged by means of a lifting or force pump. In order to keep the house mains clear, and to prevent the possibility of a discharge of deleterious gases into the houses from the mains, I propose from time to time to employ atmospheric pressure to assist in discharging the mains. To this end I form by the 20 aid of the air pump a vacuum or partial vacuum in the large chamber or receptacle, having previously by means of valves shut off the connection between the mains and the chamber. I then, when the expansion is sufficient, open the valves, and the discharge of the mains will immediately take place, the pressure of air behind any obstruction causing the instant displacement of 25 the same and driving it forward into the chamber.

By this arrangement it will be understood that I interfere in no respect with the discharge of the surface drainage, but effectually prevent it from becoming mixed with the night soil, and thereby render the utilizing of that substance as a manure a very simple and profitable operation. 30

In the accompanying Drawings I have shewn in several views the apparatus which I employ for carrying my Invention into effect. At or about the lower extremity of the vertical discharge pipe of water-closets I place in connection with the pipe in such position in the house and premises that it can be conveniently got at for examination and use, a chamber, constructed as shewn 35 in front section at Figure 1, and side elevation at Fig. 2, the cover E being removed. A is the vertical pipe from the closet; B, the chamber; C, a shaft with cross arms, at one and a half, two, or three inches asunder, forming a grating across the chamber when the shaft is stationary, so that no extraneous

Rogers' Improved Means, &c. for Collecting for Use the Excrement of Towns, &c.

or foreign matter or thing thrown into the closet beyond the size of the opening of the grating can pass through, whilst the soil and water and paper will have sufficient space for that purpose. A lever handle is attached to the shaft, so as to give the power of setting it in motion by hand from the outside, and 5 if it be found that any stoppage has taken place in the pipe or chamber, the handle is used to make the cross arms on the shaft traverse round the chamber, by which means any slight obstruction, such as the clogging by paper, &c. will be removed or broken up, so that they may pass away; the breaking up of such matter being caused by the arms passing through a grating attached to 10 the side of the chamber standing in an angular position, as shewn at D, and which angular grating will hold at its upper side any other matter which is not sufficiently small to be forced through it by the action of the revolving arms on the shaft.

If it be found that the lever handle has not power to force the arms round, 15 the chamber must then be opened, which is simply done by unscrewing a couple of thumb screws or other similar convenient arrangement, by which the side E is detached, and the obstruction within is removed.

By this means the chance of stoppage in the pipes intended to carry away the excretory matter from closets will be considerably lessened, and the 20 inhabitants of houses have the power of removing obstructions caused by the carelessness of servants, &c. without seeking for the aid of plumbers, &c. The vertical pipe below the chamber I connect with an inclining pipe made of any sufficiently strong and air-tight material, metal, iron, stone, earthenware, &c., but to be air-tight, and running from the house to a pipe or main drain to be 25 placed in all the existing sewers, and which pipe is to be also made of any sufficiently strong and air-tight material, and is designated by me, as before stated, the "house refuse main." This "house refuse main" I propose should be placed in the centre of each existing sewer, as shewn in the Diagram, Fig. 3, which represents a street in cross section; *a, a*, being the "house refuse main," 30 supported by brackets in a position so as not to interfere with the flow of the surface water, and the discharge from the kitchen drains of houses, &c. With these "house refuse mains" all water-closet pipes should be connected, by which means no excretory matter would be discharged into the general sewer, and all the evil now experienced from the collection of such matter in the 35 sewers, and the discharge from it of noxious gases, so destructive to human life, would be prevented.

These pipes or "house refuse mains" I would make of such dimensions as would be proportionate to the quantity of matter to be passed through them, and I would concentrate them (according to circumstances and the natural

Rogers' Improved Means, &c. for Collecting for Use the Excrement of Towns, &c.

fall or water shed of the locality) by degrees into one main, discharging at the principal sewer mouth wherever it might be, the length of pipes or "house refuse mains," discharging at *one point* being regulated by the nature of the locality to be drained, and I would make the joints of such construction so that they could be readily disconnected and made air-tight when connected 5 again.

At the point of discharge I place a chamber, which I designate the "filtering vacuum chamber," the construction of which will be seen in the vertical section, Fig. 4. This chamber I build up of cast or wrought iron plates, which are bolted together; I make the chamber of sufficient strength 10 to resist atmospheric pressure from without whenever I may find it necessary to produce a perfect or partial vacuum therein, and of a size proportioned to the quantity of matter and water to be passed into and through it. Into this chamber I discharge the whole contents of the "house refuse mains" at such level as would be found suitable to the rise and fall of the river into which the 15 main sewer emptied itself.

Within the chamber *a, a*, I construct a filtering bed *b, b*, composed of peat charcoal, prepared according to my special process for manufacturing that article of peat, mould or ground peat, and of broken cast iron, the whole disposed in layers or beds in such quantities or proportions as would be 20 suitable to the extent of sewage water to be passed through it. The water and matters from the house refuse mains would fall into the filtering or vacuum chamber in or about the position shewn on the Drawing of the chamber, and the weightier solids would naturally precipitate towards the bottom, but the general liquid gradually rising to its own level would pass 25 up through the grating *c*, and traverse through the filtering bed *b*, rising up a second grating *d*, or a water and pump shaft, and discharge itself through one or other of the tide valves *e* and *f*, according as the river water would allow; the number of tide valves must be such as is found desirable for the locality. Thus the filtering bed would prevent the passage of any solid matter, and 30 absorb (by means of the affinity existing between the preparations of peat moss described and the impurities existing in the sewage) that most injurious noxiousness which is now imparted to rivers by the discharge of sewage matter into them, and the use of which preparations for such purpose is already patented by me.

35

The tide valve is specially constructed so as to prevent the admission into the "filtering and vacuum chamber" of exterior water. It will be seen by the Drawing that it is something resembling the port-hole of a ship, but is hinged from below, and rises upwards to close the hinge, being made water-

Rogers' Improved Means, &c. for Collecting for Use the Excrement of Towns, &c.

tight by an india-rubber covering, and at each side are quadrants, which work in a close groove formed in the framing into which the valve shuts ; the effect of which is, that water cannot enter at the sides of the valve when open, but must pass over the valve front or door, hung, as before stated, on a hinge below.

5 On this valve front or door is secured a float, for the purpose of causing the water as it rises from without to lift the valve and keep it floating on the surface. Thus, as the water rises the valve closes and becomes perfectly water-tight by the lateral pressure from without ; whilst, when the water commences to fall so does the valve, allowing the water from within to pass
10 away. By this means water cannot enter the filtering chamber from without ; and inasmuch as its area is in all instances to *exceed* the area or contents of the whole extent of "house refuse mains" discharging into it, it will be found that the quantum of liquid matter usually to flow from water-closets will never exceed or equal the space provided in the filtering chamber for its reception
15 and storage till the fall of tide permits its discharge, therefore, there cannot be any evil suffered as now from the return of sewage matter by the rise of tide.

All the foregoing evils being guarded against, the only possible danger to be apprehended is the stoppage of the house refuse of mains from any cause ;
20 that is provided for as follows :—The "filtering vacuum chamber" is, as before stated, to be of dimensions sufficient to exceed the areal contents of the "house refuse mains" discharging into it. It is provided with a steam engine of sufficient power, which works an Archimedean screw, as is shewn in the Drawing at *g*, provided for the purpose of lifting the solid matter collected in the
25 bottom of the chamber, and discharging it into a receptacle *h* above. This receptacle forms part of a machine situate on the floor of the shed or building erected upon the vacuum chamber, and its office is to intermix and at once convert the whole matter into a comparatively dry inodorous manure, capable of being removed by any species of conveyance without inconvenience, or
30 giving out smell in the slightest degree. This being intended to be the continuous process during the day, the solids will never accumulate, and whenever it be found that a stoppage has taken place, or if it be considered desirable, the following process can be effected at low water, in case of tidal rivers, or at any stated time in others, say, every twenty-four hours.

35 The solids having been lifted out as described, the pump *i* will speedily remove whatever water may remain in the chamber to give an ample space for vacuum. This being done, the air pump *i*^{*} will, by means of the engine, withdraw the air, the ingress and egress passages or valves being first securely closed, and when the vacuum has been attained, the ingress valve will be

Rogers' Improved Means, &c. for Collecting for Use the Excrement of Towns, &c.

opened, when at the same instant of time the whole contents of the mains, whether liquid, solid, or gaseous, must commence to move from end to end of the pipes towards the vacuum, and continue to do so until the space be entirely filled again. Thus stoppages in the mains will be in fact impossible, and inasmuch as that the matter discharged into the mains will not be subjected to the action of the atmosphere during its retention in them, noxiousness within the pipes will be totally prevented, and none of the gaseous emanations from night soil, which now produce such damage to the health of towns and villages, will in future exist.

Having now set forth the nature of my Invention of "Improved Means of 10 and Apparatus for Collecting for Use the Excrement of Towns and Villages, and for Facilitating the Drainage of Houses generally," and explained the manner of carrying the same into effect, I wish it to be understood that under the above in part recited Letters Patent I claim,—

First, the separation by means of close pipes placed in the existing sewers 15 of the excretory matter discharged from water-closets and its preservation thereby in its almost original state.

And, secondly, the removal by means of a vacuum produced in a chamber in the manner described, or by any other analogous means, of stoppages in drainage or sewage pipes. 20

In witness whereof, I, the said Jasper Wheeler Rogers, have hereunto set my hand and seal, the Fifth day of October, in the year of our Lord One thousand eight hundred and fifty-seven.

JASPER W. ROGERS. (L.S.)

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FIG. 1.

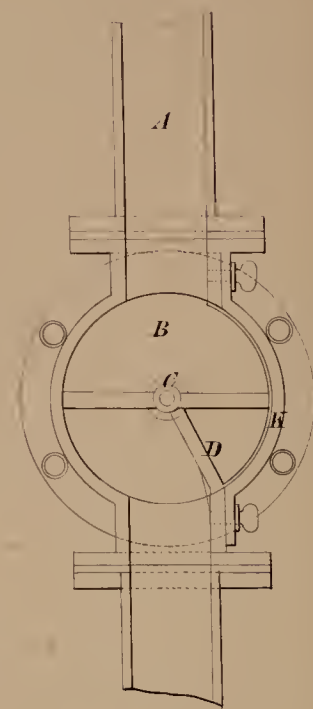


FIG. 2.

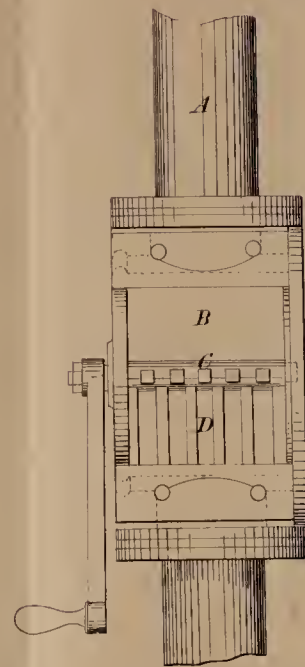


FIG. 3.

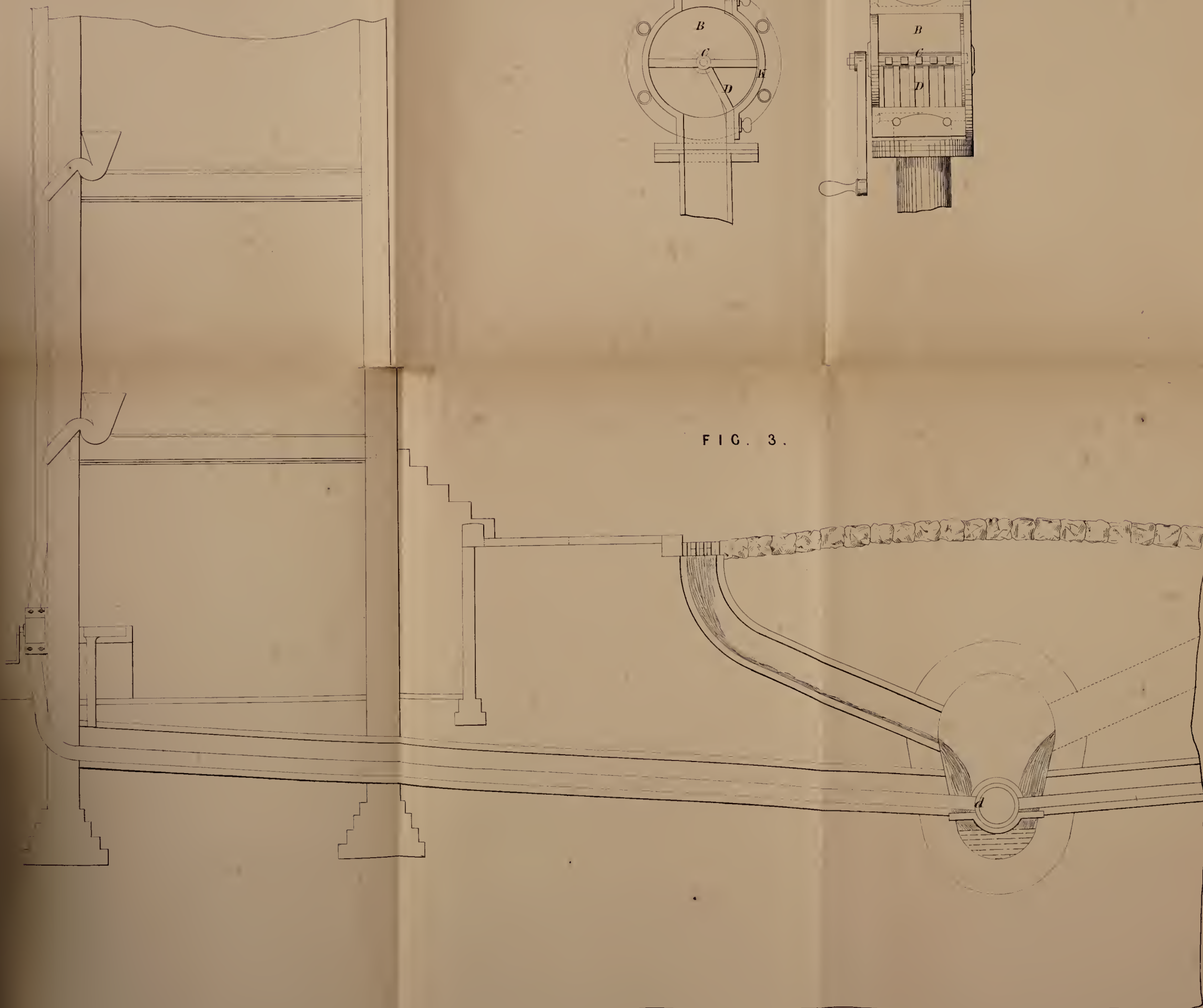


FIG. 4.

